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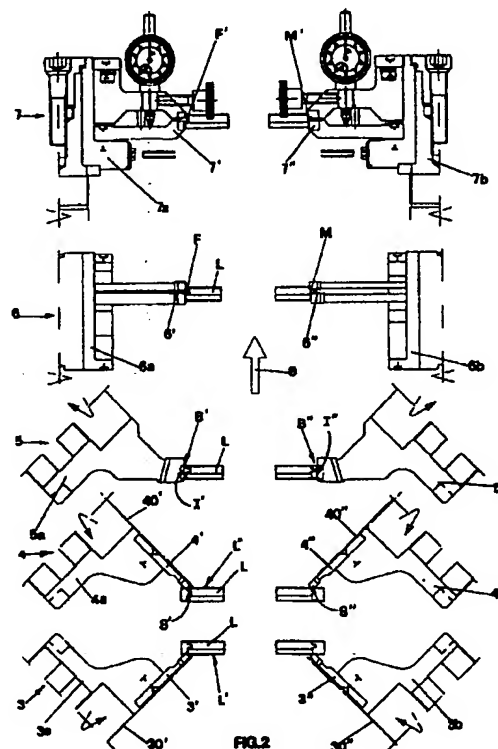
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(54) A method for profiling laths for parquet and squaring machine suited to realize such a method

(57) A method (L) for profiling laths for parquet aligned on a tow chain (9) enclosed in the case (19) of the base (2) of a squaring machine (1) provided with a plurality of operating heads (3, 4, 5, 6, 7). The method comprises the following operations: engravings the face (L') of each lath (L) towards said chain (9) a couple of longitudinal engravings (S', S''); millings on both lateral ribs (B', B'') of each lath (L); shaping the lateral ribs (B', B'') for the whole length making on one of said ribs (B') a male profile (M) and on the opposite rib (B'') a female profile (F). The distance (D) between said engravings (S', S'') is lower than the width (24) of said case (19), each of said engravings being obtained by a rotating tool (3', 3''); 4', 4'') belonging to one of said operating heads (3a, 3b, 4a, 4b) and having the rotating plane (30', 30'', 40', 40'') sloping in respect with the faces of the lath (L).



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## Description

[0001] The invention relates to a method of lath profiling used for making parquets and to a squaring machine which makes such a method for profiling laths.

[0002] It is known that, in order to make parquets, wood laths are currently used joined one with each other through joints made on their lateral sides.

[0003] In particular, suitable squaring machines make on one lateral side of the laths a male profile joint and on the opposite lateral side a female profile joint.

[0004] The joint profiles are connected one with each other and the floor surface is overlaid through a plurality of laths alongsided and connected one with each other joining the male element of each one in the female element of the adjacent lath.

[0005] The squaring machines used comprise a frame provided with a plurality of operating units, each one having a rotating tool with a profile suitable for making in the lath the desired profile.

[0006] The squaring machine is provided with a chain on which the working laths are head - tail aligned one after each other.

[0007] The chain advances continuously along the longitudinal direction of the frame and the laths are held adherent through suitable pressure means generally made by an higher track.

[0008] During the advance the laths are worked in correspondence with the ribs by the operating units tools located two by two one opposed with another and operate at the same time on both ribs of the laths themselves.

[0009] According to the known technique, the lath advancement chains are composed by a plurality of grids one pivoted after another in order to make a closed ring which is advanced along the longitudinal direction of the frame through gears, being at least one of them motorized, which engage the grids.

[0010] The chains are provided with slipping pads, which lean on sliding guide integral with the frame and internal to a protection case.

[0011] The case width is lower than the finished width of the lath which is easily manufactured in correspondence with the ribs of the shaped tools applied to the operating heads.

[0012] In particular, the parts of the lath to be manufactured project with respect to the case containing the chain and therefore they can be easily reached by the operating heads tools, which operate rotating on parallel planes or perpendicular with respect to the working surfaces.

[0013] The chains used are slipping chains of the known type, built by the same applicant of the present patent.

[0014] A disadvantage of the slipping chains is the limited speed of advance they permit, varying between 40 and 45 m/minute.

[0015] Squaring machines are known, which have

advancing speeds reaching also 60/80 m/minute using slipping chains.

[0016] These, in a similar way, are made by a plurality of grids one along another which, instead of sliding on the slides integral with the machine frame through pads, roll on the slides themselves through rolling bearings placed on the ends of a pin located transversally to each grid.

[0017] In this way the rolling friction of the bearings is substituted by the sliding friction of the pads, obtaining a great wear reduction and also a great reduction of the need of maintenance intervention.

[0018] However the slipping chains have the disadvantage of having widths higher than the correspondent slipping chains.

[0019] Therefore they cannot be used on squaring machines which have to produce parquet laths with the same finished width of that produced on squaring machines provided with slipping chains.

[0020] In fact, if the chain width, and therefore the case width holding it, is higher than the finished width of the working laths, the tools cannot reach the lath lower surface because of the obstacle due to the presence of the case protecting the chain.

[0021] In order to work on such squaring machines laths having a finished width lower than the case width protecting the advance chain, it is necessary to locate two squaring machines and work on the laths placing them with their ribs projecting alternatively on one side and on the other, with respect to the covering case of the advance chain of each squaring machine.

[0022] Alternatively it is possible to manufacture the laths passing them twice along the same squaring machine and, during each passage, to manufacture a lath rib projecting laterally from the protection case of the chain.

[0023] It can be understood that both ways of operating imply, as well as a cycle time extension and greater difficulties of equipping the machines, even a lower dimensional precision on the finished product.

[0024] At this regard, it has to be remembered that if the working panels are of the pre-defined type which is not smoothed after its location, the working allowances have to be very narrow (some centesimals), in order to prevent the covering difference which, when the work is finished, would be clearly evident.

[0025] The present invention is intended to overcome such disadvantages and limitations.

[0026] In particular, it is a first scope of the invention the realization of a method that allows, in a parquet lath squaring machine, the manufacturing of the lath lower surface in areas reentering with respect to the protection case width of the advance chain which supports them.

[0027] It is another aim of the invention the realization of a squaring machine which, using a rolling chain, can manufacture laths with a width lower than the case width enclosing the chain.

[0028] Said aims are reached through the realization of a method for parquet laths profiling placed along a tow chain enclosed in the squaring machine base case provided with a plurality of operating heads which, according to the main claim, comprises the following operations:

- engraving at least on the horizontal face of each lath towards said chain, a couple of longitudinal engravings developing for the whole length of said lath;
- milling both lateral ribs of each lath making on each rib a substantially plane and vertical surface developing for the whole length of the lath;
- shaping said lateral ribs for the whole length of each lath making on each of said ribs a male profile and on the opposite rib a female profile, each profile being made starting from the respective longitudinal engraving,

and is characterized in that the distance between said engravings is lower than the width of said case, each of these engravings being obtained through a rotating tool belonging to one of these operating heads and having the rotating plane slanting with respect to the plane defined by said at least an horizontal plane face of said lath.

[0029] According to a preferred form of realization, operating heads, forming longitudinal engravings on both faces and mounted on slanting saddles suitable for advancing the tool slantingly to said lath, are present in the squaring machine.

[0030] In the squaring machine realizing the method of the invention, the chain supporting the laths is a rolling chain and is provided with a plurality of supporting plates on which they rest the working laths.

[0031] Each plate has its width both lower than the case width enclosing the chain and than the distance between the longitudinal engravings on each lath. The plate height is sufficient to define on each side a reentering area with respect to the case housing the chain, which is delimited on the bottom of the case itself, sideways from the plate side and higher up from the lower surface of the working lath.

[0032] Such a reentering area allows the entering of the rotating tool slanting to the lath lower surface, on which the longitudinal engravings have to be made.

[0033] Advantageously, the raising of the sliding plane of the laths with respect to the case plane housing the chain through a plate having a width lower with respect to the distance between the engravings to be made on the lath, together with the slanting position of the tools, allows the manufacturing of the lath lower surface making on it longitudinal engravings, one distant from another of a lower quantity with respect to the case width housing the chain.

[0034] Still advantageously, this allows the use of rolling chains, which are larger than the correspondent

slipping chains, but they allow greater manufacturing speeds.

[0035] Said aims and advantages will be better explained during the description of a preferred form of embodiment of the invention, which is given as an indicative but not limitative title and is referred to the accompanying drawings where:

- fig. 1 represents the lateral view of the squaring machine of the invention;
- fig. 2 represents in a schematic view the manufacturing sequence which the squaring machine of fig. 1 executes on the laths;
- figg. 3, 5, 7, 9, 11, 13, 15 represent in an enlarged view some of the manufacturings represented in fig. 2;
- figg. 4, 6, 8, 10, 12, 14, 16 represent enlarged areas of figg. 3, 5, 7, 9, 11, 13, 15;
- fig. 17 represents in a transverse section a part of the squaring machine of fig. 1.

[0036] As we can see in fig. 1 the squaring machine of the invention, indicated as a whole with 1, realizing the method being also an aim of the invention, comprises a base 2 supporting a plurality of operating heads 3, 4, 5, 6, 7, located one after another.

[0037] Each couple of operating heads is formed by two opposite operating heads, each one placed on one side of the squaring machine according to the arrangement seen as a title of example in fig. 17, relative to the first couple of operating heads 3, comprising the left 3a and right 3b heads one opposite to another.

[0038] As well as the first couple of operating heads 3 just cited, are recognized, also with reference to fig. 2:

- a second couple of operating heads 4, composed by the left 4a and right 4b heads one opposite to another, each one with a tool slanting respectively 4', 4" suitable to make a longitudinal engraving S', S" on the lath surface L" upwards;
- a third couple of operating heads 5 composed by the left 5a and right 5b heads one opposite another provided with tools, respectively 5', 5", milling the lateral ribs B', B" of the laths L;
- a fourth couple of operating heads 6 comprising left 6a and right 6b heads one opposite to another, provided with tools, respectively 6', 6" making on the lath ribs a respectively female F" and male M profile;
- a fifth couple of operating heads 7 comprising left 7a and right 7b heads one opposite to another, each one having a respective tool 7', 7" for the finishing of male and female profiles previously manufactured.

[0039] The operating heads manufacture the laths L, which are advanced along the longitudinal direction of the squaring machine in the sense indicated by the

arrow 8 of fig. 1 and 2.

[0040] In particular, a plurality of laths is located one after another, leaning on a chain 9, which is wound as a ring between a back gear 10 and a shaped front slide 11, where the back gear 10 is rotated by a power group, indicated as a whole by 12.

[0041] The chain 9, as we can see in greater detail in fig. 17, is a rolling chain, being composed by plurality of grids 13 linked one with another and of the type per se known, each one having a transverse pin 14 supported on its ends by rolling bearings 15, 16 leaning on respective tracks 17, 18 belonging to the frame 2 of the squaring machine.

[0042] The chain 9 is housed on the case 19 belonging to the frame 2 of the squaring machine and each grid 13 of the chain 9 is provided with a supporting plate 20.

[0043] Each plate 20 has a datum plane 21 preferably made using a material with a high coefficient of friction, on which the lower surface L' of the working laths L rests.

[0044] A presser 22 holds the laths L adherent to the datum plane 21 and therefore also to the grid 13 of the chain.

[0045] When the power group 12 advances the chain 9, the laths L move between the operating heads and are manufactured by the rotating tools which the operating heads are provided with.

[0046] The profiling method of the laths which are the aim of the invention comprises, with reference to figg. 2 to 16, the following operations:

- engraving on both lower L' and higher L" faces of each lath L of a longitudinal lower S' and higher S" engravings developing for the whole length of said lath L, as we can see in figg. 2 to 6;
- milling both longitudinal ribs B', B" of said lath L making on each one of them a surface I', I" which is substantially plane and vertical, developing for the whole length of said lath L as we can see in figg. 2, 7 and 8;
- shaping said lateral ribs B', B" and for the whole length of each lath L making on one B' of said ribs a male profile M and on the opposite rib B" a female profile F, each one of said profiles being made starting from the respective longitudinal engraving S', S", as we can see in figg. 2 and 9 to 12;
- finishing each one of said male and female M and F profiles making the finished male M' and female F' profiles which can be observed in figg. 2 and 13 to 16.

[0047] According to the invention the distance D between the engravings S', S" is lower than the width 24 of the case 19, each engraving being obtained using a rotating tool 3', 3", 4', 4" belonging to one of the operating heads 3a, 3b, 4a, 4b and having the rotating plane 30', 30", 40', 40" slanting with respect to the plane

defined by the horizontal plane face L', L" of the lath L.

[0048] Ever according to the invention, each supporting plate 20 has its width 22 lower than the width 24 of said case 19 and the sides 25 vertically protruding from the case itself in order to define laterally to each lath L an zone Z limited by the lath L, by the side 25 of said plates 20 and by said case 19, suitable for housing the tools 3', 3" making said longitudinal engravings S', S" on the faces L' of said laths L leaning on the datum planes 21 of said plates 20.

[0049] Preferably after the milling of the male M and female F profiles, these are finished through finishing tools 7', 7", as we can see in figg. 2 and 13 to 15 obtaining finished profiles M', F'.

[0050] It is clear that the method and the machine described can undergo variations not cited in the description and not represented in the figures.

[0051] Therefore, e.g. the number of operating heads could be different and located differently from what has been shown and described.

[0052] Further, the tool and manufacture profiles made on the lath sides could be of a different type from the description, according to the final product we want to obtain.

[0053] Referring to the squaring machine, the plates put on the advance chain of the laths could be of a different form or dimensions according to the working laths, but these must have a width not higher than the distance between the engravings to be made on the lower face of the laths and on the case width.

[0054] Further, its height must allow the insertion between the laths, the case and the plates of the slanting tools operating the engravings.

[0055] We say that said executive variations and other eventual variations not cited, belonging to the claims, are intended as protected by the present patent.

#### Claims

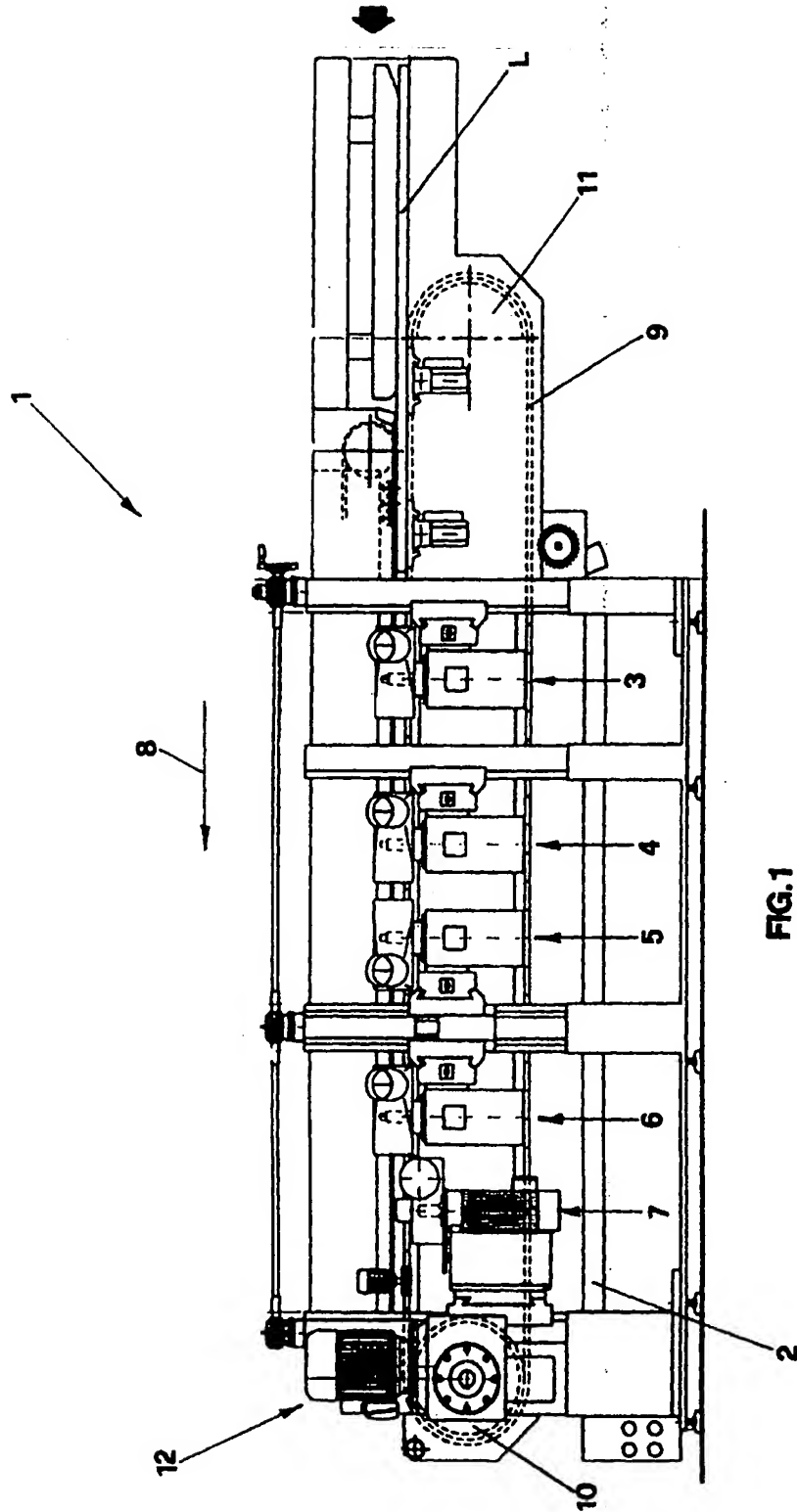
1. A method for profiling laths for parquet aligned on a tow chain enclosed in the case of the base of a squaring machine provided with a plurality of operating heads, comprising the following operations:
  - engravings at least on the plane horizontal face of each lath towards said chain a couple of longitudinal engravings expanding for the whole length of said lath;
  - millings on both lateral ribs of each lath forming on each rib a surface substantially plane and vertical expanding for the whole length of the lath;
  - shaping said lateral ribs for the whole length of each lath making on one of said ribs a male profile and on the opposite rib a female profile, each profile being made from the respective longitudinal engraving,

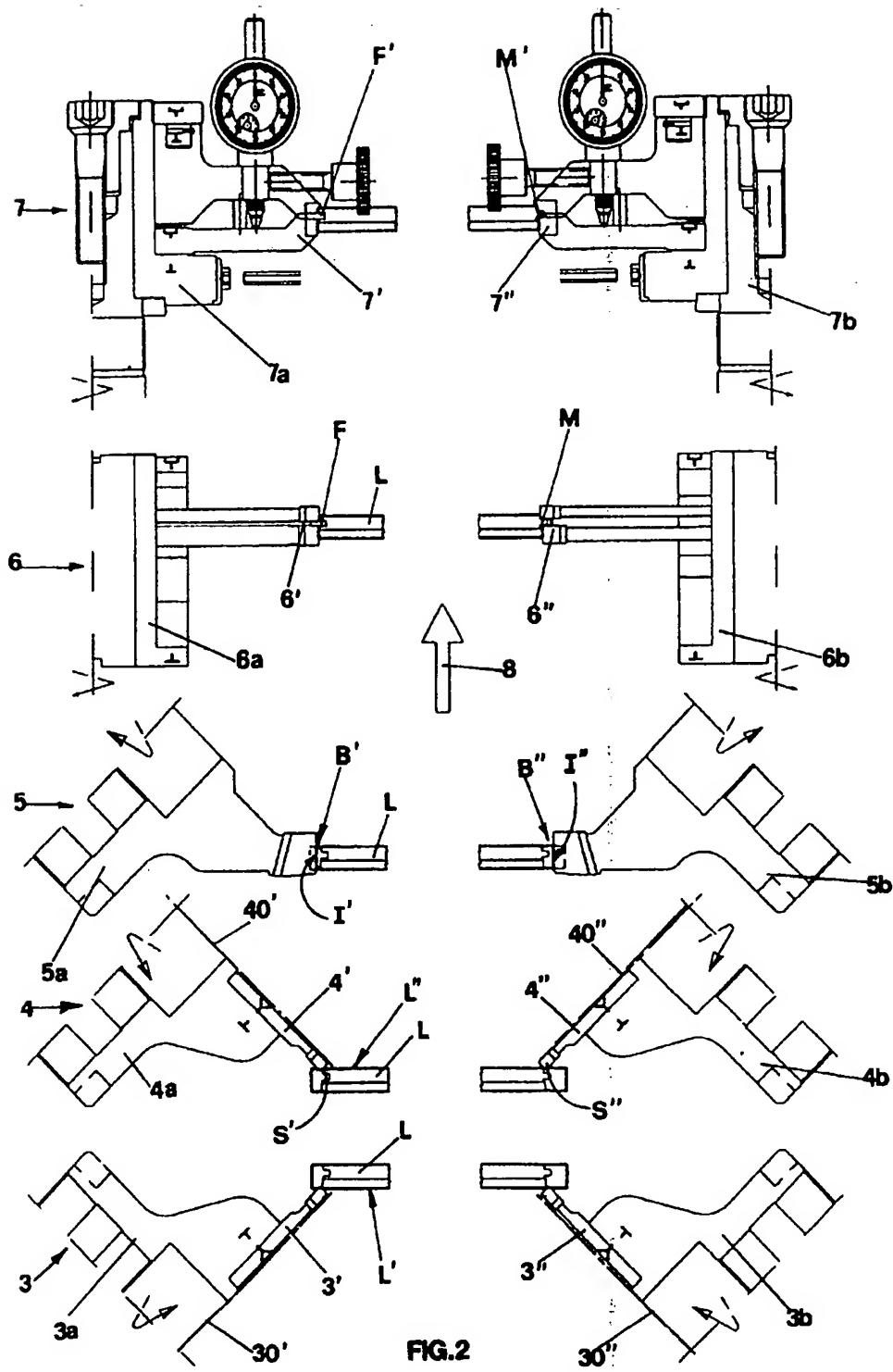
characterized in that the distance (D) between said engravings (S', S'') is lower than the width (24) of said case (19), each of said engravings being obtained by a rotating tool (3'; 3''; 4'; 4'') belonging to one of said operating heads (3a, 3b, 4a, 4b) and having the rotating plane (30', 30'', 40', 40'') sloping in respect with the plane defined by said at least a plane horizontal face (L', L'') of said lath (L).

2. Method according to claim 1) characterized in that said engravings (S', S'') are made before on the lower face (L') towards said chain (9) and then on the upper face (L'') upwards.
3. Method according to claim 2) characterized in that on each face (L', L'') of said laths (L) said engravings (S', S'') are made at the same time and next to both ribs (B', B'') of said lath (L).
4. Method according to claim 1) characterized in that said millings suitable for making said surfaces (I', I'') are made at the same time on both ribs (B', B'') of said lath (L).
5. Method according to claim 1) characterized in that each of said shaping operations, suited to make said male (M) and female (F) profiles, is followed by a finishing operation of said profiles.
6. Squaring machine (1) suitable for realizing the method according to claim 1) characterized in that it comprises:
  - a frame (2) supporting a plurality of operating heads (3a, 3b; 4a, 4b; 5a, 5b; 6a, 6b; 7a, 7b), each one provided with a rotating tool (3', 3''; 4', 4''; 5', 5''; 6', 6''; 7', 7'') for manufacturing said laths (L);
  - a back gear (10) and a front shaped slide (11) supported by said frame, between which a closed jack chain (9) supporting the work laths (L) aligned one with each other;
  - power means (12) coupled to said back gear (10) for the advance of said chain (9);
  - a protecting case (19) receiving said chain (9), supported by said frame (2);
  - a plurality of supporting plates (20) fixed to the chain (9) and provided with datum planes (21) on which the work laths (L) are rested, characterized in that each one of said supporting plates (20) has the length (22) lower than the width (24) of said case (19) and the lateral sides (25) vertically projecting from the case itself to define laterally to each lath (L) a zone (Z) limited by the laths (L), by the lateral sides of said plates (20) and said case (19), suitable for collecting tools (3', 3'') making said longitudinal engravings (S', S'') on the faces (L') of

said laths (L) resting on the datum planes (21) of said plates (20).

7. Squaring machine (1) according to claim 6), characterized in that said chain (9) is a rotating type chain, being composed by a plurality of grids (13) hingedly connected with each other through pins (14), each pin being supported in correspondence with each end of rolling means (15, 16) insisting on tracks (17, 18) belonging to the frame (2) of said squaring machine (1).
8. Squaring machine (1) according to claim 6), characterized in that said operating heads are located in couples two by two one facing another, each operating head being placed on one side of the squaring machine.





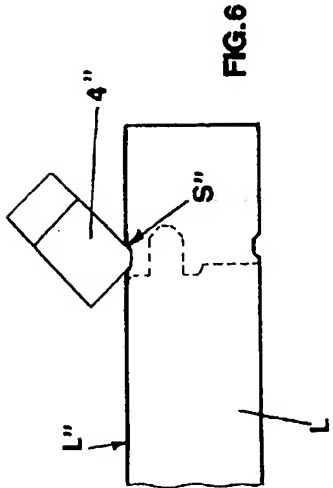


FIG. 6

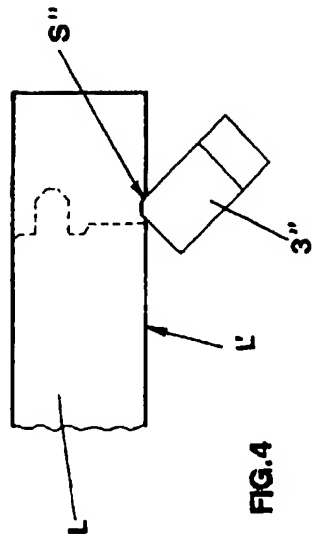


FIG. 4

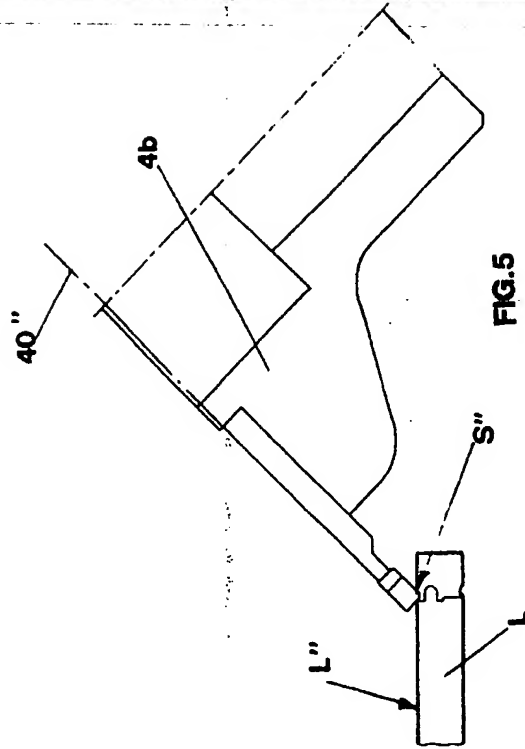


FIG. 5

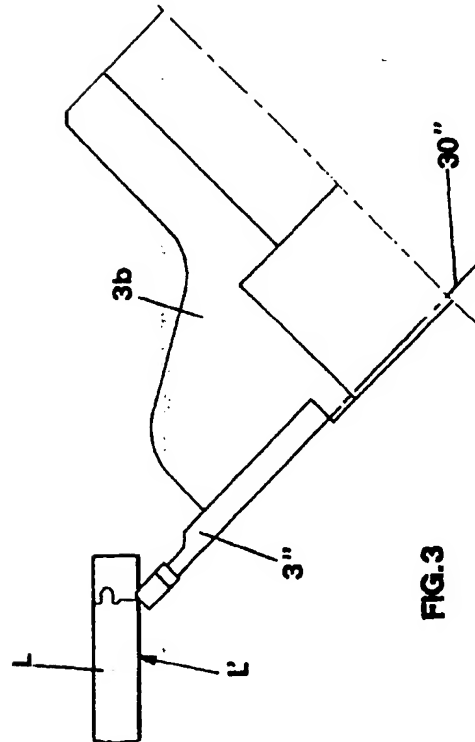


FIG. 3



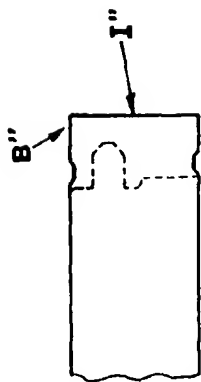


FIG. 8

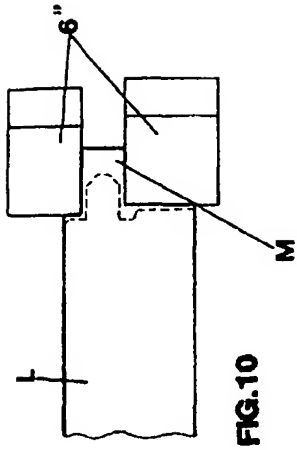


FIG. 10

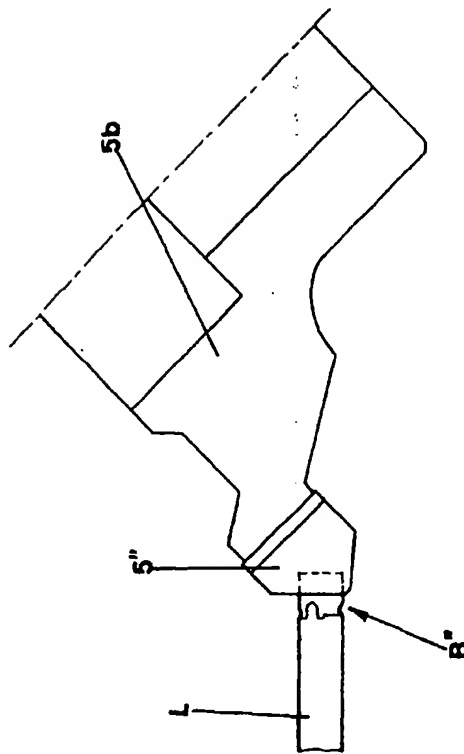


FIG. 7

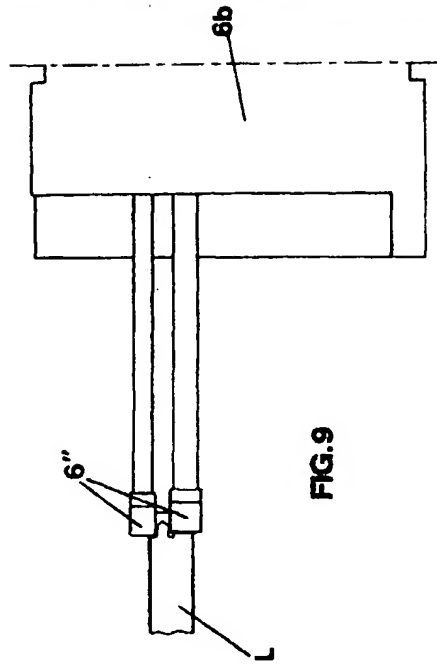


FIG. 9

